

REMARKS/ARGUMENTS

The Examiner has rejected a number of the claims under 35 U.S.C. 102(b) as being anticipated by Scholler et al. and other claims as being unpatentable over Scholler et al. under 35 U.S.C. 103(a). Applicant believes that the rejection is not well founded and submits that the claims are clearly patentable over the cited reference.

Applicant has carefully studied the Scholler et al. Patent 5,652,609 and the Examiner's comments. The electret 200 is not integrated into one wall of the channels 101-103. Rather the electret is formed by the conductors 501-503 deposited and patterned on the base 500, the spacing element 300 with openings 310 and the electret material 200 which forms one wall of the channels 101-103. The electret forms a transducer with the wall 200 adjacent the openings 310 moving responsive to applied pulses. The movement of the electret wall 200 displaces fluid by changing the volume defined by the channels 101-103 and ejects droplets of the fluid through the openings 151-153. The electret is not an ultrasonics transducer. The electret is not integrated into one wall. It is well known in the art that integration means constructing of elements in a single wafer to perform a given function. In the '609 patent the elements are not integrated into the wafer 500 but rather the elements are formed and carried on the wafer.

Claim 1 has been amended to make it clear that the ultrasonic transducer is integrated into one wall of the channel. This claim is not anticipated by the '609 patent since the patent does not teach or suggest an ultrasonic transducer, nor does it teach an ultrasonic transducer integrated into a wall of a channel.

Claims 3, 5/3 are not anticipated by the '609 patent. The transducer is not an ultrasonic transducer nor is it integrated into the base but rather it is carried by the base. The microgroove 310 does not define a channel but rather defines an open space. The channels are the openings 101-103 in the member 100.

Claims 6, 19 call for longitudinally spaced transducers. The transducers in the '609 reference are not disposed along a channel. Furthermore, claims 6 and 19 when read in connection with the claim from which they depend clearly distinguish over the reference since it does not show the claimed combination.

Claim 16 calls for a capacitive micromachined ultrasonic transducer integrated into one wall of a microchannel and a flexible membrane on the opposite wall opposite the transducer whereby ultrasonic waves from the ultrasonic transducer are reflected back to the transducer by the flexible membrane. Applicant has carefully considered the teaching in col. 5, lines 54-64 and can find no suggestion of a flexible membrane opposite the electret.

Claim 18 is more specific than the foregoing claims and calls for a silicon base with one or more capacitive micromachined ultrasonic transducers integrated into said base and a top having a microgroove sealed to said base with the microgroove over said capacitive micromachined ultrasonic transducers. Clearly the '609 patent does not teach or suggest integrating the capacitive micromachined transducer into the base.

Claims 20, 21 are rejected because the Examiner states that the '609 patent teaches a processor 600 for operating the transducers in a pulse echo mode. Nowhere in the description of the '609 patent is there any suggestion of using or operating transducers in a pulse echo mode.

Claim 22 is rejected on the basis that the '609 patent shows a compliant membrane in Fig. 2. Applicant is unable to find such a teaching.

Claims 2, 4, 5/4, 7, 8, and 15 are rejected on the basis that the provided dimensions would be obvious to one having ordinary skill in the art by performing routine experimentation. These claims all depend from independent claims which have been discussed and are allowable for the same reason. Therein claim 5/4 is not met by the Scholler et al. reference in that it depends from an allowable claim. Claim 15 is patentable for the same reason as the claims from which it depends since the combination called for in claims 3 and 4 is not suggested or taught in the Scholler et al. reference.

A number of the claims are rejected on the basis of modified Scholler. However, modified Scholler does not disclose microchannels with integrated ultrasonic transducers, nor does Scholler et al. disclose microgrooves including a compliant membrane.

Claims 23 and 26/5/3 are rejected as being anticipated by the combination of Scholler et al. and Hawkins. Hawkins teaches a resistive element for mixing fluids within a channel. Scholler et al. fails to disclose an ultrasonic transducers which is integrated into the channel, and

the combination of the two certainly does not suggest Applicant's combination as set forth in claims 23 and 26. The combination of Scholler and Hawkins is not suggested by either of the references and certainly would not be obvious to one skilled in the art. The Examiner is in essence using hindsight to arrive at a combination which even if combined would not result in Applicant's device which calls for an ultrasonic transducer integrated into the channel.

In view of the above, favorable action is respectfully requested.

The Commissioner is hereby authorized to charge any other fees determined to be due to Deposit Account 50-2319 (Order No. A-69570/AJT(468330-1249)).

Respectfully submitted,


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